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HYPNOTISM IN ANIMALS.¹

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Mesmerism, or more properly *hypnotism*, has been recognized under various names in the history of all nations.

The same influences which work the modern phenomena of hypnotism are undoubtedly identified with the manifestations of magic found described in ancient history. The magic of Zoroaster, the wonderful performances of the magi of the East—among the ancient Persians, Hindoos and Egyptians—the spells and incantations of the Grecian and Roman bracles, the methods of divination, the remarkable feats of the snake charmers of India and Egypt, all belong to the same category.

And so also might we include the more recent wonderful manifestations of religious mania which swept Europe in the seventeenth century as an epidemic, known as the "dancing mania," and was literally a national calamity. In our own country it was

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represented at the close of last century by the witchcraft of New England, and still later within the memory of men now living, by the "convulsive" and "laughing" mania among the Methodists—notably in the State of Kentucky, where it is said that on one occasion as many as 5000 persons in camp meeting were under the "influence" at one time. The victims fell in convulsions and soon passed into a state of ecstatic trance, and were laid out on the grass in rows to recover themselves.

Physicians are brought in contact continually with similar conditions as forms of disease, under the names of hysteria, catalepsy, ecstasy and lethargy. No more marvelous stories can be found in the whole range of fiction than are presented as sober matters of fact in the standard works on nervous diseases—such as of Charcot, Weir Mitchell and Hammond.

In this place are to be classed the modern miracles of the Church. The history of "Our Lady of Lourdes" finds an exact parallel in many of the cases that have been lately so thoroughly studied at the Hospice Salpêtrière in France, by Chalcot.

All of these phenomena may be grouped into a single allied genus, of which the various forms of manifestation may be considered species. *Mesmerism* is one of the species, clairvoyance and modern spiritualism may be mentioned as others. No systematic or scientific attempt was made to study into the nature of these phenomena until the time of Mesmer, from whom this term is derived.

Mesmer was a German physician who went to Paris in 1778 to practice his new discovery of "animal magnetism" in the cure of disease. In six years he amassed a large fortune, and during that time kept Paris in a fever of excitement with his doings.

In 1784 a royal commission was appointed, of which Benjamin Franklin was one, to investigate his methods. Their report was unfavorable to the claims of animal magnetism, and Mesmer's popularity soon declined.

Mesmer's exploits in Paris are designated by Mills as the first epoch in "mesmerism."

The second epoch is that of Braid, an English physician, 1841. Braid disclaimed anything like animal magnetism in his operations, and explained them by referring to physiological and psychological influences in the subject.

He gave the name of *hypnotism* to the phenomena produced,

and like Mesmer applied his skill to the treatment of diseases; the diseases claimed to be influenced favorably being neuralgia, hysteria, epilepsy and the like. Surgical operations were also performed painlessly during the anæsthesia of the hypnotic state. Teeth pulling, excision of mamma, and even amputations of the thigh, are among the operations performed. Braid published a voluminous book upon the subject, relating his views and experiences.

The third epoch of Mills we are now passing through. The experiments and writings of Heidenhain of Germany, of Charcot and Richer of France, and of Beard, Hammond and Mills in this country, have revived the interest in the subject, and hypnotism is again being subjected to a rigid scrutiny.

The subject is one of great interest in itself, not only from a scientific standpoint, but also from the fact that more precise knowledge of the laws governing the phenomena presented may be of practical value. That hypnotism has been used with apparent benefit in the treatment of certain diseases, appears in the experience of many writers upon the subject, and it is certain that the anæsthesia thus induced may be taken advantage of for the performance of surgical operations. Recently in an exhibition by Dr. Hammond before a medical society in N. Y., a tooth was extracted without pain, and a subject was burned with a red hot iron without conscious sensation. If the application of hypnotism could be reduced to a science, it is among the possibilities of the future that it might supercede the use of such agents as chloroform and ether as anæsthetics.

In the present state of knowledge, however, this is impracticable, as well also as its use as a therapeutic agent. Although the subject has engaged the attention of investigators for centuries, no acceptable explanation of the manifestations of mesmerism has yet been offered.

Undoubtedly a large proportion of the acts shown in public exhibition are due to trickery and collusion, but I think no one can witness such an exhibition as was recently given in Washington, by Carpenter, without feeling that *all* is not deceit, that there is an influence at work which thus far has not been fathomed.

Mesmer called it animal magnetism, and claimed it to be an emanation from his person, as electricity from a battery.

Braid rejected the animal magnetism theory, and referred the phenomena to psychical influences (*neurypnology*).

The latest attempt at a theory is that of Heidenhain, just promulgated: "Hypnotism is due to inhibition of the cortical cells of the cerebrum, caused by gentle, prolonged stimulus of the nerves of the face, eyes or ears."

This definition of Heidenhain's is, to my mind, but little more satisfactory than any preceding one. It merely attempts to describe by an hypothesis a physical effect, leaving out of sight the ultimate cause. I have given more time than I had intended to the general subject of hypnotism, and have perhaps only stated facts known already to the members of this society. I have done so, however, in explanation of my reason for bringing before your notice the subject of hypnotism in animals.

1. The general subject is one of more than passing interest to men of science.

2. It is one the true inwardness of which is but little understood, and which presents a field for further investigation.

3. The study of the phenomena presented by experiments upon animals, and of observations on their habits, offers a promise of more definite results than can be obtained from observations upon man alone.

It is necessary to state that I have no pet theory of my own to propound or uphold, but it is my hope in reviewing and briefly analyzing the history of hypnotism in the lower animals, to develop facts known to naturalists that may have an important bearing upon the subject. The practice of magic on the lower animals has a somewhat parallel history in ancient nations to that already referred to in connection with man. All nations and tribes have their conjurors, more or less expert. Probably the most expert are the "serpent charmers" of India and Egypt. Of these mention is made in the most ancient writings as well as in modern books of travel. The serpent is the favorite animal on which to exhibit the influence of these charms—for what reason may possibly be explained by modern herpetologists. In Dr. Spry's "*Modern India*," published in 1837, is a description of the method of operating of one of these Indian magicians. He says: "An eminent physician, skeptical on this point (serpents and birds being drawn and held as by a charm), in company with other English gentlemen thus tested the fact. Taking a serpent

charmer alone, they brought him to a distant heap of rubbish, and causing him to lay off all his raiment that there might be no deception practiced upon them, they watched his movements.

"Approaching the pile with a serpent-like hiss and nervous working of the features and limbs, which became more and more excited and violent, presently serpent after serpent of the most venomous kind, showed their heads and gradually moved towards their charmer, until reaching out his hand he took them as so many lifeless withes, and deposited them in his basket." Numberless attested incidents of a similar kind might be given, the operator winding the serpent about his neck and pressing coil after coil into his mouth, and rendering it rigid as a stick or pliant as a cord at pleasure.

In a report on the "Manners and Customs of the modern Egyptians," by E. W. Lane, 1836, is an almost identical account of snake charmers of Egypt, and their method of drawing serpents out from the houses.

In 1646 Athanasius Kercher, an Italian monk, described what he termed the "Experimentum mirabile." It was an experiment which has since become sufficiently familiar to all of us, but which appeared to the old monk little less than miraculous.

He tied the feet of a hen together and laid her on the ground, where after cries and violent struggling she became quiet, "as if," says he, "despairing of escape through the fruitlessness of her motions, she gave herself up to the will of her conqueror."

Kircher then drew a chalk line in a diagonal direction from one eye to the other, loosened the ribbon, and the hen, although left perfectly free, remained immovable, even when he attempted to rouse it. Kircher believed that the hen thought the chalk line was a string by which it was bound as at the feet, and attributed its quiet state to this idea.

The most extended observations upon hypnotism in animals have been made by Czermak in the private physiological laboratory of the University of Leipsic. The results obtained were reported in two lectures delivered by him in January, 1873, and published (in translation) in *Popular Science Monthly* for Sept. and Nov., 1873.

Czermak dwells upon the unreliability of untrained observation in such matters, and says that the usual reports, while honest and technically true from the observer's standpoint, are in their conclusions generally false.

To such inaccurate reports he applies the term "events viewed unequally." From this view the "experimentum mirabile" of Kircher is characterized as inaccurate, it is an "event viewed unequally." Czermak repeated the experiment, tying the legs of the fowl, pressing it down upon its side and making the chalk mark in front of its bill. It laid quiet, panting just as Kircher has described. The chalk line was then dispensed with, and still the animal remained quiet; and finally the tying of the feet was left out, and still the same result. It was not therefore the imagination of the hen, produced by the chalk line, as Kircher supposed, that rendered the animal lethargic, but some other cause not yet explained.

A friend of Czermak's told him a story about mesmerizing crawfish; that by making certain passes in the direction of the body, the animal became stiff and soon stood on its head, and after a while by reverse passes it resumed its natural position and crawled off. Czermak was skeptical, but a capture from the neighboring brook dissipated his doubts. Just what has been described took place. Not only this but Czermak himself found he also possessed the same magic power over the Crustacean. He was not satisfied to stop here. Pursuing his experiments, he found that passes were not needed either to put the crawfish on end or to bring him down again. He obtained a basketful of the animals, turned them out on the table, stirred them up a little, and lo! all of them turned tail up and stood so for a short time, when they gradually descended and crawled away. It was further observed that the crawfish would remain motionless in any position in which forcibly held until struggling ceased. Czermak repeated his experiments with ducks, geese and swans with similar results; but whether he is justified in claiming, as he does, with the positiveness of *italics*, "that he has proved the appearance of hypnotism in animals," I think is open to doubt, and it may be, in the light of the naturalists' knowledge, that even he has not viewed his "events equally." Czermak makes another statement with which I very much doubt whether those who have studied the habits of animals, will agree.

He says: "With animals every one feels safe from all thoughts of deception." Evidently he had never surprised a 'possum in a midnight raid upon a hen-roost; or if he had witnessed that interesting animal "playing possum," he may have considered it a

very aggravated case of "hypnotism in animals," for certainly the hen and crawfish are entirely eclipsed by the wily marsupial.

No naturalist will say that we are "free from all thoughts of deception with animals," for I am sure each person present can call to mind many instances of deliberate deception, not only on the part of animals in the restricted sense, but cases of insects simulating death appear to be very common.

Indeed it seems to be an instinct of self-preservation with insects, worms and many others of the lower orders of life, in case of danger to draw up into as small a space as possible and remain perfectly quiet until the danger is passed.

In the year 1859, while enthusiastically interested in ornithology, I shot a turkey buzzard (*Cathartes aura*). The bird was winged, and when approached was standing up under a laurel bush, looking brightly about, one wing hanging. As I came up he first disgorged, then as I continued to approach, his head began to droop to one side, and by the time I reached him he lay upon his side apparently lifeless. Believing that he really was dead, I with difficulty forced him into my game bag and proceeded home, a distance of two miles. He was then taken from the game bag and thrown down in the yard, limp and lifeless.

My surprise can be imagined when calling out the family to view the capture a moment later, he was found running around the yard as lively as ever. On our approach, however, the same motions were enacted, and again he lay upon his side dead. This routine followed each approach, until after a while he became accustomed to the presence of persons, and then would simply hiss and disgorge. (In the "Birds of the Northwest," 1874, p. 383, Dr. Elliott Coues recounts a similar incident.)

Mr. Nelson informs me that he has witnessed a like action on the part of the wild goose when wounded. As soon as it finds escape impossible, it will stretch out its neck and remain stiff and immovable, so that it may be handled in this condition, the muscles remaining rigid as in catalepsy. If, however, it is not disturbed, it will soon begin to peep around and gradually attempt to get away.

In the case of the opossum, the simulation of death is so perfect that only the closest examination can determine that life still is present—in the pulsation of the heart and in the almost suppressed respiration. In this condition either the animal has lost

the sensation of pain, or else it possesses most wonderful powers of endurance, for it permits itself to be actually vivisected without showing the least sign of consciousness. If, however, attention is withdrawn, the sly rascal opens his eyes, glances around, and, if the coast is clear, gently departs.

I have stated that the various explanations offered of the phenomena of hypnotism, seem unsatisfactory. I have no doubt that you have now the same impression in regard to this paper, that it is unsatisfactory in offering nothing definite in the way of classifying the phenomena under discussion. I have indicated my belief that in the phenomena of the so-called mesmerism, there is *something*, some influence or influences at work not yet understood, and like *life* itself, possibly may never be. We may be obliged to content ourselves with calling this subtle substance by a name, be it mesmerism, hypnotism, or what not, and resting there. The direction, however, in which progress can undoubtedly be made with positive advantage, is in classifying the phenomena presented. In this direction does a knowledge of the peculiarities of animals, learned by both experiment and observation, become valuable. The factors entering into the production of the phenomena noticed in the experiments of Czermak and others, are: Fear, dissembling, curiosity, training, and changes in the condition of the blood.

1. *Fear*.—In the case of the hen and canary, an overwhelming irresistible force is used, reducing the poor creatures to a feeling of utter helplessness in the hands of a giant-man.

They lie in any position in which they are placed, because they fear to move. A chalk line or bright button attract their attention and excite fear because they know not but they might explode like dynamite if a move be made. Through the influence of profound fear also, a state of semi-unconsciousness may be induced, just as we hear of persons being *paralyzed* by fear.

We can realize to a small degree what this state of helplessness may mean to a small animal, by imagining the feelings of a traveler stopped by highwaymen with a loaded carbine at either temple. When he is ordered "*hands up*," up his hands go, and so are likely to remain until the coercion is removed.

Another homely example. Prisoners of war are enclosed in a stockade, sentinels with loaded muskets pace the platform around the top; a line is drawn around the inside space a certain dis-

tance from the fence called the *dead line*. It is but a step to cross it, but I need not say that step is not taken. This line is as forbidding to the prisoner as is the chalk line to the hen.

2. *Dissembling*.—Trickery and collusion on the part of the human subject which enters as such an important element into human exhibitions, I dismiss with the mere mention. There is not time to discuss it within the limits of this paper.

Dissembling in animals I have perhaps already referred to sufficiently in taking exception to Czermak's statement that "with animals every one feels safe from all thoughts of deception." I therefore simply refer again to our old friends the opossum, the turkey buzzard and the goose.

Under this head also would be classed the "playing dead" of insects, worms, &c., and the familiar example of the skill shown by birds in pretending to be wounded, fluttering helplessly along the ground, to draw an intruder away from the nest.

3. *Curiosity*.—I believe that curiosity plays a part in the power exercised by the snake charmers of India. The operator goes to a stone pile, and his noises and motions excite curiosity on the part of the serpents. So also is it probable that music has charms.

Another probable element is, that the Indian magician has studied the calls of the serpents, and by his imitation draws them forth. We know how easy it is in this way, by imitating their notes, to call birds. The success of the shooter of "shore birds" depends very much upon his expertness in imitating the whistle of the different species. The phenomena of handling serpents, rendering them stiff or flaccid at pleasure, I do not pretend to understand, but hope an explanation will be developed in the course of the discussion.

Examples of curiosity displayed by animals are numerous and well known. The hunter on the plains decoys deer by simply lying down and kicking up his heels. Ducks are *told* on the shores of the Chesapeake by waving a red flag, or by having a little dog trained to run up and down the bank barking. The ducks swim in to see what the strange object is, until they are brought within range of the gun.

Mr. Henry Elliott, in his monograph on the fur seal (Census of the Fisheries, 1882) tells how the crafty foxes of the Pribylov islands capture sea birds by working on their curiosity. He

says: "One of the curious sights of my notice in this connection was the sly, artful and insidious advances of reynard at Tolstoi Mees, St. George, where conspicuous and elegant in its fluffy white dress, it cunningly stretches on its back as though dead, making no sign of life whatever, save to gently hoist its thick brush now and then; whereupon many dull and curious sea birds (*Graculus bicristatus*) in their intense desire to know all about it flew in narrowing circles overhead, lower and lower, closer and closer, until one of them came within sure reach of a sudden spring and a pair of quick snapping jaws."

Who shall say after this exhibition of craftiness that animals are free from deceit, or that birds are less consumed by the fire of curiosity than their allies, the featherless bipeds.

4. *Training*.—Where experiments are made upon the same animal repeatedly, we may suppose that it becomes, in a measure, *trained*.

It comes to learn what is expected of it, and in the case of the more intelligent animals, as the dog, there is added a desire to please its master.

At the meeting of the Intern. Medical Congress held in London, Aug., 1881, Professor Goltz, of Strassburg, exhibited a dog with certain portions of the cerebrum removed, and from the effects upon the animal, argued against the theory of Professor Ferrier as to certain localizations in the brain. In the course of the discussion, however, it was developed that the actions of the dog were in a great measure due to an unconscious training on the part of his master, Professor Goltz, who had so often exhibited the animal that he had come to know what was expected of him.

5. *Changes in the condition of the blood*.—Another element of influence also in the experiments upon fowls, is the interference with the respiration produced by the forcible compression of the chest walls. In this way proper aeration of the blood does not take place, and the accumulation of venous blood in the nerve centers produces a sort of lethargy.

Ornithologists, when collecting, are in the habit of killing wounded birds by compressing the thorax, this method not injuring the plumage; and they are familiar with the condition first of violent struggles, then of lethargy and finally of insensibility, before death is complete. Frequently when the bird is apparently lifeless, life returns when the compression is too soon removed.

A condition of anæsthesia in man may also be produced by an almost opposite state of affairs. It is known to physicians that rapid forcible inspiration of air will induce anæsthesia, and slight surgical operations have been thus painlessly performed.

We have referred now to the influence of fear, dissembling, curiosity and training. These have their influence over both man and the lower animals alike. But there are still other conditions and qualities of the mind which exert their influence over man alone—such as the power of the imagination, the disposition of imitation, and the influence of the will of the operator.

In regard to the imagination I think it is unnecessary to do more than refer to it. Its power is proverbial, and is especially realized by physicians both in the manner it impresses disease and treatment. We see continually diseases which are produced by imagination and which are as well cured through the same agency.

Witness many miraculous cures. In the case of Mrs. Jennie Smith, R. R. evangelist; she was sixteen years in bed paralyzed, but cured in one night by power of prayer. In hysterical paralyses there is added a suspension of *will power*. If this can be restored, cure is assured. The cure may be sudden, the result of a powerful impression made upon the dormant faculties, or of an intense appeal to the imagination. In this case it is considered by the laity as miraculous. Or the cure may be gradual, under the persevering effort of a good physician. In this latter case no superhuman agency is supposed to have been evoked. This may appear foreign to our subject, but is really germane, as illustrating an important element in hypnotism.

Imitation.—The power of imitation is as well known as that of imagination. Who has not been present in church when, during the stillness of an impressive sermon, some one begins a hacking, irritative cough. Soon it is taken up by one after another, until several will be coughing at once, while many others will, with difficulty repress the desire. So with gaping or yawning.

The hysterical epidemics already referred to, such as the dancing mania, the laughing and convulsive attacks at religious revivals, etc., are evidences of the power of imitation.

So also, undoubtedly, the professional mesmerist owes much of his success in public exhibitions to the same influence. The force of example impels many persons, almost against their will,

to take part in the foolish show, while others with difficulty resist the same impulse.

Lastly, as an element in hypnotism, is the *will* of the operator. Undoubtedly the best operators are persons of strong will and great persistence. The influence of a strong will is felt constantly in the daily walks of life, in all our intercourse with our fellows. In the mesmerism of men, those whose minds are naturally weak, or who have become enfeebled by disease, are the ones most easily controlled. This has long been known, but recently very satisfactorily exemplified by Charcot and his associates in France at the Hospice Salpêtrière (an institute for the treatment of nervous diseases). In the Biological Society of Washington, there is material for many good masters of mesmerism, but I doubt if a single good subject can be found.

I have now reviewed and classified all the elements entering into the production of hypnotism, as fully as the time will allow.

That a very large proportion of the phenomena exhibited, may be referred to one or other of these divisions, I think is evident from the requisites which Heidenhain lays down as necessary to the development of hypnotism in man.

1. Undivided attention. Concentration of the attention by an upward gaze at a bright object placed near the eyes.
2. Willingness and desire on the part of the subject. Persons cannot be mesmerized against their knowledge and consent.
3. Use of touches, passes, etc. (to stimulate the imagination).
4. Direct command from the operator to sleep.

In regard to the second of these—"willingness and desire on the part of the subject"—much doubt has been expressed, and professional mesmerists are not willing to admit that consent is necessary. The question is of special interest in consequence of its medico-legal bearing, and the statement of Heidenhain is in accordance with the views of experts who have given the subject study. Many cases might be cited to prove the opposite, but an analysis of them show that they "are events viewed unequally."

Persons who have been frequently mesmerized acquire such a frame of mind from habit and intuitive training that they may be thrown into this condition merely by the power of the imagination. Thus a mesmerist so influenced a lady, while in the adjoining room, she being told that he was putting her to sleep. On another occasion she was told that he was mesmerizing her from

the next room, and she immediately went to sleep, although the pretended operator was not in the house and knew nothing about it. In a "good subject" it may be sufficient to impress upon their minds the idea that the event is about to take place, in order to secure its occurrence.

I have said that there was still *something* about hypnotism which had not yet been fathomed. By that I do not wish to be understood as saying that there is anything mysterious or supernatural in it. But simply that we do not yet understand sufficient of the intimate workings of mind, or of the relation between mind and matter to follow the connection between various mental attributes. We are accustomed to consider these attributes as seen in the ordinary or normal state, but are not prepared to say what would be the effect of abolishing or suspending certain functions, upon other functions of the mind.

In a well marked case of hypnotism in man, freed from all elements of deceit, the condition of the mind of the subject shows an alteration of normal functions and a perversion of the will power, so that he is completely under the guidance and control of the operator.

Sensation is also so perverted that it too appears to be at the mercy of the operator. Heidenhain expresses it in more exact language by saying that there is "inhibition of the cortical cells of the cerebrum."

(At the close of the reading of the paper, a hen and canary bird were introduced and successfully "mesmerized" by Dr. Prentiss.)

